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on the averages of large series of measurements of hybrid offspring, but is very probably vitiated by the occurrence of artificial parthenogenesis so easily produced in the case of echinoderm eggs. Another series of experiments cited by Vernon in support of his view is hardly more convincing. It consists in experiments made by Ewart with mating rabbits early or late in rut.

"Mendel's Law" is treated as a law of "hybridization" only, its profound significance as a general law of heredity being unnoticed, while the Galton-Pearson "Law of Ancestral Heredity" is treated as *the* law of heredity. To many biologists the evidence for the Mendelian principles is too strong and too clearly counter to the Galton-Pearson law to be thus lightly brushed aside. It also raises a strong presumption against Vernon's idea of a heritage *gradually* changing during the ripening of the sexual products.

Part III, contains a brief survey of a familiar field. Natural selection is recognized as the efficient agency in evolution. Adaptive variations are discussed at some length and the evidence for and against their inheritance are considered. Environment is regarded as directly inducing germinal variation.

W. E. C.

PHYSIOLOGY.

Von Fürth's Comparative Chemical Physiology of the Lower Animals.¹—Perhaps the most important general advance made by physiology in the last ten years has been the inclusion of the lower animals within its field of research. Just as anatomy was immensely illuminated by a thorough investigation of the structure of the lower forms and thus became truly comparative, so physiology will gain a clearer and more certain insight into life processes by a study of these where they occur in greatest simplicity. What has already been done in this direction especially from the chemical standpoint is scarcely accessible to the student except through the original sources of publication for ever so excellent a book as Verworn's General Physiology passes over this subject most superficially. Von

¹Fürth, O. von. *Vergleichende chemische Physiologie der niederen Tiere*. Jena, Fischer, 1903. 8vo., xiv + 670 pp.

Fürth's very extensive compilation will therefore be a welcome guide in this growing field of research. Although von Fürth's volume marks a new departure, the book is arranged on extremely conservative lines. After a brief introduction, it deals with the chemistry of the blood, respiration, digestion, excretion, animal poisons, secretion, etc., a series of heading that suggest at once the sections of the old-fashioned human physiology. It seems really remarkable that such a classification as this should have been adopted, for if there is one lesson taught by comparative physiology more clearly than any other, it is the non-essential character of the blood. Large groups of the lower metazoa are complete organisms and yet they are without this fluid. Why then should the blood be chosen as a means of introducing the student to the chemical physiology of these lower forms? But aside from this traditional treatment of the sections, the substance of these sections is refreshingly modern, and with their excellent bibliographies they form admirable summaries of many new fields of work. The exhaustiveness of the treatment is well indicated by the subject digestion which covers over a hundred pages and takes up in sequence digestion in the protozoa, sponges, cnidaria, echinoderms, worms, molluscs, crustaceans, and other arthropods, devoting a chapter to each. Such a work as this, despite its defects, must find its way to the hands of every advanced student of animal physiology.

Mind in Nature.¹—This little book is at bottom an argument for a certain form of vitalism. The author, while admitting the value of the chemico-physical descriptions of movements given by Loeb and other investigators of similar interests and aims, insists that it is impossible to account for those forms of movement which we usually designate as action or conduct on this ground. He believes that there is a gap in the physical series which must be bridged by some such factor as the psychic if a complete description of action (*Handlung*) is to be given.

The work consists of a careful study of the forms of movement. Reflexes are classified as :

I. Simple.

II. Complex { 1. Synchronous { a. Homometachronous.
 { 2. Metachronous { b. Heterometachronous.

¹ Driesch, Hans. *Die "Seele" als elementarer Naturfaktor. Studien über die Bewegungen der Organismen.* Leipzig, Englemann, 1903. 8vo, vi-97 pp.